

OVERVIEW OF PROFESSIONAL GEOPHYSICIST EXAMINATION OUTLINE

Content Area/Subarea	Content Area Description	Percent Weight
I. Preliminary Geophysical Project Design <i>Ia. Feasibility Study</i> <i>Ib. Project Design</i>	This area assesses the candidate's ability to design a geophysical project that is consistent with the client's objectives.	43 (25) (18)
II. Fieldwork Preparation and Data Collection	This area assesses the candidate's ability to implement a geophysical design and/or workplan in the field.	14
III. Data Analysis and Interpretation	This area assesses the candidate's ability to analyze, interpret, and communicate geophysical data and results.	34
IV. Safety	This area assesses the candidate's ability to identify hazards and safely manage geophysical work and personnel.	9
Total		100

Note. The values for Subareas Ia and Ib are breakdown values of Content Area I and are not added to the total percentage.

PROFESSIONAL GEOPHYSICIST EXAMINATION OUTLINE

I. Preliminary Geophysical Project Design (43%) - This area assesses the candidate’s ability to design a geophysical project that is consistent with the client’s objectives.			
Task Statements		Knowledge Statements	
Subarea Ia. Feasibility Study			
T1	Determine need for geophysical project by evaluating the client’s objective(s).	K1	Knowledge of the types of projects (e.g., geohazard, geologic, geotechnical, environmental) that would benefit from geophysical investigations.
		K2	Knowledge of geophysical investigation methods and their applications.
		K5	Knowledge of local, state, and federal regulations related to geophysical projects.
		K7	Knowledge of physical characteristics of the site that impact expected geophysical findings.
		K9	Knowledge of conceptual geophysical model types and their applications.
		K10	Knowledge of types of measurement instruments and their applications for geophysical project design.
		K11	Knowledge of geophysical equipment limitations as related to project design.
		K13	Knowledge of interference sources that affect geophysical project design.
T2	Identify conditions that may impact the scope of the geophysical project through field inspection, site history, and/or review of existing data.	K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K2	Knowledge of geophysical investigation methods and their applications.
		K3	Knowledge of methods for obtaining existing geophysical, geological, and other relevant data.
		K4	Knowledge of methods for reviewing existing geological, and other relevant data in preparation for geophysical projects.
		K7	Knowledge of physical characteristics of the site that impact expected geophysical findings.
		K10	Knowledge of types of measurement instruments and their applications for geophysical project design.
		K11	Knowledge of geophysical equipment limitations as related to project design.
		K12	Knowledge of the components of a geophysical investigation design.
		K13	Knowledge of interference sources that affect geophysical project design.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K16	Knowledge of the limitations of geophysical survey design.

I. Preliminary Geophysical Project Design (43%) - This area assesses the candidate’s ability to design a geophysical project that is consistent with the client’s objectives.			
Task Statements		Knowledge Statements	
Subarea Ia. Feasibility Study			
T3	Identify public safety concerns and relevant local, state, and federal regulations and apply to the geophysical project.	K1	Knowledge of the types of projects (e.g., geohazard, geologic, geotechnical, environmental) that would benefit from geophysical investigations.
		K5	Knowledge of local, state, and federal regulations related to geophysical projects.
		K6	Knowledge of public safety issues that should be addressed when planning geophysical work.
T4	Develop a conceptual geophysical model for the geophysical project.	K2	Knowledge of geophysical investigation methods and their applications.
		K3	Knowledge of methods for obtaining existing geophysical, geological, and other relevant data.
		K7	Knowledge of physical characteristics of the site that impact expected geophysical findings.
		K8	Knowledge of methods used to calculate geophysical estimates.
		K9	Knowledge of conceptual geophysical model types and their applications.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
T5	Identify geophysical investigation methods, including measurement types and equipment in accordance with site conditions, geology, and client objectives.	K2	Knowledge of geophysical investigation methods and their applications.
		K3	Knowledge of methods for obtaining existing geophysical, geological, and other relevant data.
		K4	Knowledge of methods for reviewing existing geological, and other relevant data in preparation for geophysical projects.
		K9	Knowledge of conceptual geophysical model types and their applications.
		K10	Knowledge of types of measurement instruments and their applications for geophysical project design.
		K11	Knowledge of geophysical equipment limitations as related to project design.
		K13	Knowledge of interference sources that affect geophysical project design.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K16	Knowledge of the limitations of geophysical survey design.

I. Preliminary Geophysical Project Design (43%) - This area assesses the candidate’s ability to design a geophysical project that is consistent with the client’s objectives.			
Task Statements		Knowledge Statements	
Subarea Ib. Project Design			
T6	Design a geophysical project based on site conditions, geology, regulations, and client objectives.	K2	Knowledge of geophysical investigation methods and their applications.
		K4	Knowledge of methods for reviewing existing geological, and other relevant data in preparation for geophysical projects.
		K5	Knowledge of local, state, and federal regulations related to geophysical projects.
		K6	Knowledge of public safety issues that should be addressed when planning geophysical work.
		K7	Knowledge of physical characteristics of the site that impact expected geophysical findings.
		K11	Knowledge of geophysical equipment limitations as related to project design.
		K12	Knowledge of the components of a geophysical investigation design.
		K13	Knowledge of interference sources that affect geophysical project design.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K16	Knowledge of the limitations of geophysical survey design.
T7	Develop quality assurance/quality control (QA/QC) plan(s)/procedures to ensure the validity of data gathered during the geophysical project.	K2	Knowledge of geophysical investigation methods and their applications.
		K5	Knowledge of local, state, and federal regulations related to geophysical projects.
		K8	Knowledge of methods used to calculate geophysical estimates.
		K10	Knowledge of types of measurement instruments and their applications for geophysical project design.
		K13	Knowledge of interference sources that affect geophysical project design.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K15	Knowledge of quality assurance/quality control (QA/QC) requirements/procedures related to geophysical data.

I. Preliminary Geophysical Project Design (43%) - This area assesses the candidate’s ability to design a geophysical project that is consistent with the client’s objectives.			
Task Statements		Knowledge Statements	
Subarea Ib. Project Design			
T8	Identify the limitations of the geophysical project using available data.	K5	Knowledge of local, state, and federal regulations related to geophysical projects.
		K6	Knowledge of public safety issues that should be addressed when planning geophysical work.
		K7	Knowledge of physical characteristics of the site that impact expected geophysical findings.
		K10	Knowledge of types of measurement instruments and their applications for geophysical project design.
		K11	Knowledge of geophysical equipment limitations as related to project design.
		K13	Knowledge of interference sources that affect geophysical project design.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K15	Knowledge of quality assurance/quality control (QA/QC) requirements/procedures related to geophysical data.
		K16	Knowledge of the limitations of geophysical survey design.
T9	Prepare workplan(s) in accordance with geophysical project requirements.	K5	Knowledge of local, state, and federal regulations related to geophysical projects.
		K6	Knowledge of public safety issues that should be addressed when planning geophysical work.
		K7	Knowledge of physical characteristics of the site that impact expected geophysical findings.
		K10	Knowledge of types of measurement instruments and their applications for geophysical project design.
		K11	Knowledge of geophysical equipment limitations as related to project design.
		K12	Knowledge of the components of a geophysical investigation design.
		K13	Knowledge of interference sources that affect geophysical project design.
		K14	Knowledge of physical characteristics that differentiate the target of a geophysical investigation from its surroundings.
		K15	Knowledge of quality assurance/quality control (QA/QC) requirements/procedures related to geophysical data.
		K16	Knowledge of the limitations of geophysical survey design.
		K17	Knowledge of workplan requirements/components for geophysical projects.
		K18	Knowledge of local, state, and federal workplan requirements.

II. Field work Preparation and Data Collection (14%) - This area assesses the candidate's ability to implement a geophysical design and/or workplan in the field.			
Task Statements		Knowledge Statements	
T10	Calibrate instruments used in geophysical projects according to equipment specifications.	K19	Knowledge of calibration requirements and techniques for instruments used in geophysical projects.
		K21	Knowledge of methods and procedures for using equipment for geophysical projects.
T12	Revise workplan(s) to accommodate actual conditions encountered in the field.	K24	Knowledge of methods for identifying interference(s) and instrument error(s) when collecting data for geophysical projects.
		K25	Knowledge of methods for modifying geophysical survey design to improve data quality to accommodate field conditions.
		K26	Knowledge of methods for minimizing interference(s) and instrument error(s) when collecting data for geophysical projects.
		K27	Knowledge of magnetic measurement methods and their applications.
		K28	Knowledge of seismic measurement methods and their applications.
		K29	Knowledge of gravity measurement methods and their applications.
		K30	Knowledge of electrical measurement methods and their applications.
		K32	Knowledge of electromagnetic measurement methods and their applications.
		K33	Knowledge of acoustic measurement methods and their applications.
		K34	Knowledge of radioactivity measurement methods and their applications.
		K35	Knowledge of downhole logging measurement methods and their applications.
		K36	Knowledge of methods for evaluating the quality of field data collected during geophysical projects.

II. Field work Preparation and Data Collection (14%) - This area assesses the candidate's ability to implement a geophysical design and/or workplan in the field.			
Task Statements		Knowledge Statements	
T13	Record data using the measurement methods outlined in the workplan(s) or geophysical survey design.	K20	Knowledge of basic field techniques (e.g., map reading, grid layout, compass use) and their applications for geophysical projects.
		K21	Knowledge of methods and procedures for using equipment for geophysical projects.
		K22	Knowledge of methods for implementing geophysical surveys.
		K23	Knowledge of survey techniques (e.g., GPS) and their applications.
		K26	Knowledge of methods for minimizing interference(s) and instrument error(s) when collecting data for geophysical projects.
		K27	Knowledge of magnetic measurement methods and their applications.
		K28	Knowledge of seismic measurement methods and their applications.
		K29	Knowledge of gravity measurement methods and their applications.
		K30	Knowledge of electrical measurement methods and their applications.
		K32	Knowledge of electromagnetic measurement methods and their applications.
		K33	Knowledge of acoustic measurement methods and their applications.
		K34	Knowledge of radioactivity measurement methods and their applications.
		K35	Knowledge of downhole logging measurement methods and their applications.

II. Field work Preparation and Data Collection (14%) - This area assesses the candidate's ability to implement a geophysical design and/or workplan in the field.			
Task Statements		Knowledge Statements	
T14	Verify that the geophysical measurements/data are collected in accordance with applicable standards and workplan(s).	K19	Knowledge of calibration requirements and techniques for instruments used in geophysical projects.
		K20	Knowledge of basic field techniques (e.g., map reading, grid layout, compass use) and their applications for geophysical projects.
		K21	Knowledge of methods and procedures for using equipment for geophysical projects.
		K22	Knowledge of methods for implementing geophysical surveys.
		K23	Knowledge of survey techniques (e.g., GPS) and their applications.
		K24	Knowledge of methods for identifying interference(s) and instrument error(s) when collecting data for geophysical projects.
		K27	Knowledge of magnetic measurement methods and their applications.
		K28	Knowledge of seismic measurement methods and their applications.
		K29	Knowledge of gravity measurement methods and their applications.
		K30	Knowledge of electrical measurement methods and their applications.
		K32	Knowledge of electromagnetic measurement methods and their applications.
		K33	Knowledge of acoustic measurement methods and their applications.
		K34	Knowledge of radioactivity measurement methods and their applications.
		K35	Knowledge of downhole logging measurement methods and their applications.
		K36	Knowledge of methods for evaluating the quality of field data collected during geophysical projects.
		K37	Knowledge of methods for processing field data for geophysical projects.

III. Data Analysis and Interpretation (34%) - This area assesses the candidate's ability to analyze, interpret, and communicate geophysical data and results.			
Task Statements		Knowledge Statements	
T15	Prepare geophysical data for analysis.	K38	Knowledge of methods for preparing geophysical data for analysis.
		K39	Knowledge of geophysical software program applications for data analysis and processing.
		K40	Knowledge of geophysical software program limitations for data analysis and processing.
T16	Process data using applicable geophysical techniques.	K38	Knowledge of methods for preparing geophysical data for analysis.
		K39	Knowledge of geophysical software program applications for data analysis and processing.
		K40	Knowledge of geophysical software program limitations for data analysis and processing.
		K41	Knowledge of methods for manually processing geophysical data.
		K42	Knowledge of data analysis techniques for geophysical projects.
		K44	Knowledge of mathematical principles related to geophysical projects.
		K45	Knowledge of physics principles related to geophysical projects.
		K47	Knowledge of factors that influence the interpretation of geophysical data.
		K49	Knowledge of methods for integrating nongeophysical (e.g., geological) information into geophysical findings.
T17	Analyze data using applicable geophysical principles.	K38	Knowledge of methods for preparing geophysical data for analysis.
		K39	Knowledge of geophysical software program applications for data analysis and processing.
		K40	Knowledge of geophysical software program limitations for data analysis and processing.
		K41	Knowledge of methods for manually processing geophysical data.
		K42	Knowledge of data analysis techniques for geophysical projects.
		K43	Knowledge of geological principles related to geophysical projects.
		K44	Knowledge of mathematical principles related to geophysical projects.
		K45	Knowledge of physics principles related to geophysical projects.
		K46	Knowledge of methods for interpreting geophysical project results.
		K47	Knowledge of factors that influence the interpretation of geophysical data.
		K48	Knowledge of factors that warrant modification of the original conceptual geophysical model.

III. Data Analysis and Interpretation (34%) - This area assesses the candidate's ability to analyze, interpret, and communicate geophysical data and results.	
Task Statements	Knowledge Statements
T18 Interpret geophysical results by integrating geological information, site conditions, and project objectives.	K39 Knowledge of geophysical software program applications for data analysis and processing. K40 Knowledge of geophysical software program limitations for data analysis and processing. K42 Knowledge of data analysis techniques for geophysical projects. K43 Knowledge of geological principles related to geophysical projects. K44 Knowledge of mathematical principles related to geophysical projects. K45 Knowledge of physics principles related to geophysical projects. K46 Knowledge of methods for interpreting geophysical project results. K47 Knowledge of factors that influence the interpretation of geophysical data. K48 Knowledge of factors that warrant modification of the original conceptual geophysical model. K49 Knowledge of methods for integrating nongeophysical (e.g., geological) information into geophysical findings.
T19 Prepare technical document(s) to communicate the finding(s) of the geophysical investigation.	K39 Knowledge of geophysical software program applications for data analysis and processing. K40 Knowledge of geophysical software program limitations for data analysis and processing. K42 Knowledge of data analysis techniques for geophysical projects. K43 Knowledge of geological principles related to geophysical projects. K44 Knowledge of mathematical principles related to geophysical projects. K45 Knowledge of physics principles related to geophysical projects. K46 Knowledge of methods for interpreting geophysical project results. K47 Knowledge of factors that influence the interpretation of geophysical data. K49 Knowledge of methods for integrating nongeophysical (e.g., geological) information into geophysical findings. K50 Knowledge of methods to document and explain geophysical results. K51 Knowledge of methods for preparing data visualizations (e.g., digital presentations, maps, cross-sections) to depict results of geophysical projects. K52 Knowledge of client/regulatory requirements for reporting geophysical findings. K53 Knowledge of methods for communicating geophysical findings to the public.

IV. Safety (9%) - This area assesses the candidate's ability to identify hazards and safely manage geophysical work and personnel.			
Task Statements		Knowledge Statements	
T20	Identify environmental and operational hazards that are relevant to geophysical fieldwork.	K54 K57 K59 K61	Knowledge of types of operational and environmental hazards on geophysical project sites. Knowledge of site safety plan(s)/procedures related to geophysical projects. Knowledge of methods for assuring the safe operation of tools and equipment used in geophysical projects. Knowledge of Cal/OSHA (California Occupational Safety and Hazard Act) laws and regulations related to geophysical work.
T21	Implement the site safety plan(s)/procedures to minimize hazards during geophysical projects.	K54 K55 K56 K57 K58 K59 K61	Knowledge of types of operational and environmental hazards on geophysical project sites. Knowledge of methods for minimizing hazardous site conditions. Knowledge of safety-related local, state, and federal requirements related to geophysical project sites. Knowledge of site safety plan(s)/procedures related to geophysical projects. Knowledge of types of personal protective equipment (PPE) used for geophysical projects and their applications. Knowledge of methods for assuring the safe operation of tools and equipment used in geophysical projects. Knowledge of Cal/OSHA (California Occupational Safety and Hazard Act) laws and regulations related to geophysical work.
T22	Manage fieldworkers in accordance with applicable laws and regulations.	K54 K55 K56 K57 K58 K59 K61	Knowledge of types of operational and environmental hazards on geophysical project sites. Knowledge of methods for minimizing hazardous site conditions. Knowledge of safety-related local, state, and federal requirements related to geophysical project sites. Knowledge of site safety plan(s)/procedures related to geophysical projects. Knowledge of types of personal protective equipment (PPE) used for geophysical projects and their applications. Knowledge of methods for assuring the safe operation of tools and equipment used in geophysical projects. Knowledge of Cal/OSHA (California Occupational Safety and Hazard Act) laws and regulations related to geophysical work.

IV. Safety (9%) - This area assesses the candidate's ability to identify hazards and safely manage geophysical work and personnel.			
Task Statements		Knowledge Statements	
T23	Report geohazard findings to clients and/or governmental agencies.	K56	Knowledge of safety-related local, state, and federal requirements related to geophysical project sites.
		K61	Knowledge of Cal/OSHA (California Occupational Safety and Hazard Act) laws and regulations related to geophysical work.
		K62	Knowledge of how geohazards impact human occupancy, infrastructure, and the environment.
		K63	Knowledge of responsibilities for reporting geohazards to governmental agencies and clients.